TCT-809

Percutaneous Repair of Paravalvular Regurgitation: Characteristics and Acute Outcomes of 40 Patients

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Background: Percutaneous repair of periprosthetic paravalvular leak (PVL) is emerging as a potential therapy in patients that are at high surgical risk. We report our outcomes with this procedure in patients referred for catheter based repair of periprosthetic paravalvular regurgitation.
Methods: We retrospectively identified 43 percutaneous PVL closures in 40 patients performed at our institution between May 2009 and November 2012.
Results: The mean age of patients undergoing percutaneous PVL closure was 70 years, with 98% of patients in NYHA class III or IV heart failure and 63% of patients having evidence of hemolytic anemia. There was a significant burden of co-morbidities with a mean estimated mortality of 10.2% as predicted by the STS score. Majority (86%) were mitral PVL closures. In 81% of cases antegrade transseptal approach was used. General anesthesia was used sparingly (4 cases). In 50% of cases, more than 1 device was needed. Amplatzer Vascular Plug II was the most frequently used device. Percutaneous PVL closure was successful in 91% of patients with residual regurgitation of grade ≤1+ in 51% patients and ≤2+ in 95% of patients. Procedural failure occurred in 4 cases.Reasons for failure included prosthetic valve impingement, failure to cross the leak and significant residual leak despite device. Thirty day mortality was 7.5% (3 patients). A total of 3 patients had surgical valve replacement following percutaneous PVL closure; of which 2 patients underwent surgery within 30 days and one patient had surgery after 1.6 years. At a mean follow up of 208 days (range 1-888 days), all cause mortality was 30%.
Conclusions: Percutaneous PVL closure is a valuable treatment option in patients with paraprosthetic paravalvular regurgitation at high surgical risk, with good acute procedural success rates.

TCT-810

Long-term 25 Years Follow-up of Mitral Valvuloplasty with Single Balloon. Independent Predictors of Survival and Event Free Survival

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Background: Mitral balloon valvuloplasty (MBV) with single balloon (MBVSB) is the less expensive technique to perform MBV. The objectives were to evaluate long-term follow-up (FU) of MBVSB Balt and to determine independent predictors of survival and event-free survival (EFS).
Methods: From 1987 to 12-31-2013, 526 procedures of MBV were performed, 404 (76.8%) with MBVSB Balt, being 256 procedures with long-term FU. The balloon diameter was 25 mm in 5 procedures and 30 mm in 251, mean dilatation area 7.02±0.30 cm2. The FU was 55±33 (1 to 198) months. To determine independent predictors of survival and EFS it was used the multivariate Cox analysis.
Results: Mean age was 38.0±12.6 (13 to 83) years, being 222 (86.7%) female, 215 (84.0%) in sinus rhythm, echo score (ES) 7.2±1.5 (4 to 14) points and echo mitral valve area (MVA) pre-MBVSB 0.93±0.21 cm2. Mean pre and post-MBV area (Gorlin) was 0.90±0.20 and 2.02±0.37 cm2 ($p< 0.001$) and success MVA ≥1,5 cm2 in 241 (94.1%) procedures and mean pulmonary artery pressure pre and post MBV were 27±10 and 20±7 mmHg. Three (1.2%) patients began the FU with severe mitral regurgitation (SMR). At the end of the FU 118 (46.1%) patients were in NYHA FC I, 71 (27.7%) in FC II, 53 (20.7%) in FC III, 3 (1.2%) in FC IV and there were 11 deaths (4.3%), 9 (3,5%) were cardiac death, being 5 during cardiac surgery. There were 17 (8.2%) patients with new SMR at the end of the FU. Twelve (4.7%) patients were submitted to new MBV, 27 (10.5%) to mitral valve surgery and 70 (26.3%) patients used no medication at the end of the FU. Independent predictors of survival with 7 variables were: ES ≤8 ($P< 0.002$, HR=0.143), age ≤50 years old (P=0.014, HR 0.202) and absence of mitral valve surgery in the FU (P=0.004, HR 0.170), being cardiac surgery in fhe FU the 7th variable and with 6 variables independent predictors were: EE ≤8 ($p< 0.001$, HR 0,116) and age ≤50 years old (P=0,011, HR=0,203). Independent predictors of EFS were: absence of prior comissurotomy ($P< 0.002$, HR 0.318), female (P=0.036, HR 0.466) and MVA post MBV.
Conclusions: MBVSB Balt was efficient with durable results similar to others techniques being less expensive.

TCT-811

First-in-Human CardiAQ Transcatheter Mitral Valve Implantation via Transapical Approach

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Background: Many patients with severe symptomatic native mitral valve regurgitation are not candidates for surgical replacement or repair due to high operative risk. While percutaneous repair therapies such as MitraClip are a viable option for such patients, many have unfavorable anatomy that precludes treatment. Transcatheter mitral valve implantation (TMVI) is a novel treatment option. We describe the first in human implantation of the CardiAQ valve via transapical approach.
Methods: An 88-year-old female patient with severe mitral regurgitation secondary to A1/A2 leaflet flail and refractory NYHA class IIIb dyspnoea was referred for treatment. Co-morbidities included prior coronary artery bypass surgery and renal failure. Left ventricular systolic function was preserved. Following discussion in our heart team meeting the patient was declined surgery and deemed unsuitable for MitraClip. TMVI was performed under compassionate use provision.
Results: The 33Fr CardiAQ delivery system was inserted via transapical approach in the hybrid operating theatre. Using transoesophageal echocardiography guidance, successful device implantation was achieved with an accurate and stable prosthesis position and immediate elimination of the mitral regurgitation with only trace paravalvular leak. Over a follow up period of 1 week the prosthetic valve remained well functioning as assessed by sequential echocardiography, the patient experienced significant symptomatic improvement and recovery was uneventful.
Conclusions: Our initial experience with transcatheter mitral valve implantation using the CardiAQ device via transapical approach highlights the feasibility and effectiveness of this promising therapy in treating severe mitral regurgitation.

TCT-812

Transesophageal echocardiography guided trans-apical mitral implantation

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Background: Transcatheter mitral valve implantation is an emerging therapeutic option for high-risk patients with severe symptomatic mitral regurgitation. The Tiara™ is a catheter-based self-expanding mitral bio-prosthesis, specifically designed to fit the complex anatomical structure of the mitral apparatus. It is implanted using a transapical approach.. Because transesophageal echocardiography (TEE) provides superb imaging of the mitral valve in both 2 and 3-D, and has the ability to provide real time information, TEE is ideally suited both assessing suitability and guiding the implantation of trans-catheter mitral procedures. We describe here the TEE guidance of the first 2 human implantations of the Tiara.
Methods: The first 2 cases of Transapical Mitral Valve Implantation (TAMI) of the Tiara were performed in a 72 year-old male and a 60 years old woman with severe functional MR. Anatomical suitability for Tiara implantation was confirmed by transthoracic echo, TEE and CT angiographic assessment prior to implantation. Implantation was guided by both TEE and fluoroscopy. TEE was critical in determining the orientation of the "D" shaped Tiara prior to deployment. In particular, the orientation of the device in the left atrium was confirmed using X-plane imaging, and rotational orientation by real time 3-D echo. Final deployment position, paravalvular mitral regurgitation and the presence of any complications was evaluated.
Results: TEE guided Tiara implantation was completed successfully in both patients and both valves were deployed in an appropriate position and orientation. There were no complications detected by TEE at the time of implantation. Specifically no left ventricular outflow tract obstruction, pericardial effusion or deterioration in LV or RV function was noted. No new wall motion abnormalities were noted. Mitral regurgitation was reduced from 4+ to trivial and trans-mitral gradient was minimal in both patients.
Conclusions: TEE echo provides critical real time information that is integral to successful positioning, deployment and assessment of outcomes with trans-catheter mitral valve implantation.

TCT-813

Immediate and 18-Month Outcome of Balloon Mitral Valvuloplasty: Comparison of Inoue and Multi-Track System

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Background: To compare the immediate and 18-month clinical and echocardiographic outcome of Inoue and multi-track system for balloon mitral valvuloplasty (BMV).
Methods: We included 78 consecutive patients with moderate to severe rheumatic mitral stenosis (MS) [mitral valve area (MVA)< 1.5 cm2] and clinically indicated BMV. The first 42 consecutive patients were assigned to Inoue BMV (group I), and the following 36 consecutive patients were assigned to multi-track system (group M). Clinical and echocardiographic assessment was performed before, immediately after, 3 months after, and 18 months after the procedure.
Results: The successful immediate result [MVA > 1.5 cm2 and mitral regurgitation (MR) < II/IV] was achieved in 40 (95.23%) patients of group I and 34 (94.44%) patients of group M ($P = 0.12$). Immediately after BMV,MVA increased from 0.9 ± 0.4 to 1.7 ± 0.5 cm2 in group I and from 0.8 ± 0.2 to 1.9 ± 0.3 cm2 in group M ($P < 0.01$). Bilateral commissural splitting was significantly higher in group M ($P < 0.01$). This was associated with higher incidence of mild commissural mitral regurgitation. There were no significant differences of moderate to severe MR. Both procedure and fluoroscopy time were significantly shorter in group I ($P < 0.001$). Eighteen month clinical and echocardiographic evaluation was available for